

NOTE ON A SPECIMEN OF ANNULARIA

FROM NEAR DUNEDOO, NEW SOUTH WALES.

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(Plate XXV.)

A SMALL collection of specimens of *Glossopteris* was recently donated to the Queensland Museum. They were collected by Mr. W. Elliott Nixon at a spot about eight miles from Dunedoo, New South Wales, and forwarded by him to the Museum. Most of the specimens are *Glossopteris browniana*, but on one specimen (No. F 15/985/5) there is a plant of considerable interest.

The specimen shows a jointed stem with whorls of leaves at the nodes. There are two internodes and three nodes with their whorls of leaves preserved. The stem has a breadth of 2 mm. and the internodes are 1.7 and 2 cm. long. The whorls consist of from 18 to 20 leaves; those in a single whorl are unequal in length, the lateral ones in the specimen being the longest. The leaves unite to form a narrow basal collar; they are up to 3 mm. in breadth and 2 cm. in length and possess a prominent midrib. They are elongately lanceolate with a somewhat acute tip. Viewed under the microscope the midrib is seen to be striated longitudinally and some of the leaves show markings transverse to the midrib. These transverse markings appear to be of something more than a lithological character, but are not sufficiently definite to be regarded as venation.

The specimen agrees with those larger species of *Annularia* which are regarded as the foliage of Calamitean stems. It may tentatively be referred to *A. stellata* (Schloth.), and is somewhat like that figured by Seward.¹

In *Annularia* the leaves of a whorl are supposed to be in one plane; this character is difficult to determine in fossils, where the specimens are always on a flat surface. It is doubtful whether it is the case with the larger species which are the foliage of *Calamites*.

This specimen comes from strata belonging to the upper freshwater series (Newcastle Coal Measures) of the so-called Permo-Carboniferous System in New South Wales. As far as I have been able to ascertain no systematic collecting has been done in the district from which the specimen was obtained.

The only *Annularia* which has previously been recorded from the so-called Permo-Carboniferous rocks of Eastern Australia is *Annularia australis*² from the Greta Coal Measures of N.S.W.

Schmalhausen³ placed this species in his genus *Cyclopitys*, an equisetaceous-looking genus which he assigned to the conifers. Feistmantel,⁴ however, did

¹ Fossil Plants, vol. 1, p. 339, fig. 88.

² Feistmantel, Palæontographica, Suppl. Band. iii, 1878-9.

Tenison-Woods, Proc. Linn. Soc. N.S.W., viii (1883), p. 86.

Etheridge Jr., Proc. Linn. Soc. N.S.W., 2nd ser., v, pt. 1, p. 47, plates ii, iii.

³ Bull. Acad. Sc. St. Pétersbourg, 1883, tome xxviii, p. 426, 2 plates.

⁴ Mem. Geol. Surv. N.S.W., Pal. No. 3, 1890, p. 83.

Palæontologia Indica, Fossil Flora Gondwana Sm., vol. iv, pt. 2, p. 44.

not agree with Schmalhausen in this determination. Arber⁵ expresses doubt as to whether the specimens called *Annularia australis* may correctly be referred to the genus *Annularia*. They almost certainly do not belong to *Cyclopitys*. They are fragmentary and it seems probable that they may be fragments of *Phyllothecca*.

The present specimen then is the first one of *Annularia* from New South Wales. Arber⁶ has pointed out that the association of *Annularia* (a type of Calamitean foliage) with the Glossopteris flora indicates a mingling of northern and southern types of Permo-Carboniferous plants, and he says "the absence, so far, of any trace of a Calamitean stem in these rocks is somewhat remarkable if the species in question [*A. australis*] is really the foliage of a Calamite." It is quite possible that further collecting in this district may produce such stems.

The existence of the continent of Gondwanaland has lately been questioned by Matthew⁷ who, arguing strongly for the permanency of the ocean basins, believes that it is unnecessary to postulate such a continental land-mass to account for the peculiar distribution of the Glossopteris flora.

He argues that "the principal lines of migration in later geological epochs have been radial from Holarctic centres of dispersal." Should this prove to be the case as far back as Carboniferous, associations of the so-called northern and southern types of Permo-Carboniferous plants would be, perhaps, more easily explained than at present.

Annularia is abundant in the Upper Carboniferous and Permian rocks of the Northern Hemisphere. Several species of Calamitean stems are known from the Carboniferous rocks of New South Wales and Queensland.

Specimen: *Annularia stellata* (?)

Locality: Eight miles from Dunedoo, New South Wales.

Registered number: F 15/985/5.

⁵ Glossopteris Flora, British Museum Cat., 1905, p. 30.

⁶ Loc. cit.

⁷ Ann. New York Acad. Sc. xxiv (1915), p. 190.